MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Mail Stop 2321
Gaithersburg, Maryland 20899

SRM Number: 1800b
MSDS Number: 1800b
SRM Name: Eighteen Non-Methane Hydrocarbon Compounds in Nitrogen
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SECTION I. MATERIAL IDENTIFICATION

Material Name: Eighteen Non-Methane Hydrocarbon Compounds in Nitrogen

Description: This SRM mixture is supplied in a DOT 3AL specification aluminum (6061 alloy) cylinder with a water volume of 6 L. Mixtures are shipped with a nominal pressure exceeding 12.4 MPa (1800 psi), which provides the user with 0.73 m^3 (25.8 ft^3) of useable mixture. The cylinder is the property of the purchaser and is equipped with a CGA-350 brass valve, which is the recommended outlet for this NMHC mixture. NIST recommends that this cylinder **NOT** be used below 2.8 MPa (400 psi).

Other Designations: Non-Methane Hydrocarbon Compounds in **Nitrogen** (dinitrogen) **Gas Cylinder**

Name	Chemical Formula	CAS Registry Number
Nitrogen	N_2	7727-37-9

DOT Classification: Non-flammable Gas, UN1956

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Nitrogen	> 99	simple asphyxiant
		Rat, Inhalation: LC_{50}: 1 068 mg/m^3/4 h
		Mouse, Inhalation: LC_{LO}: 320 mg/kg
Non-Methane Hydrocarbon Compounds[(a)] Ethane, Hexane Propane, Heptane Propene, Bezene iso-Butane, iso-Octane n-Butane, Octane iso-Butane, Toluene iso-Pentane, Nonane n-Pentane, ortho-Xylene 1-Pentane, Decane		Not applicable

[(a)]This material contains non-methane hydrocarbon compounds, many of which have been reported to have toxic, mutagenic, and/or carcinogenic properties, and should be handled with care. The carcinogens in this material have a total concentration of < 0.1 % and **DO NOT** require individual MSDS information under current regulations. For actual concentrations, see the corresponding Certificate of Analysis.

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Nitrogen	
Appearance and Odor: colorless, odorless gas	**Freezing Point (@ 4000 mm Hg):** -57 °C
Relative Molecular Mass: 44.01	**Boiling Point:** not available
Density: 1.522	**Viscosity:** not applicable
Vapor Density (air = 1): 1.5	**Vapor Pressure (@ 21°C):** 43 700 mm Hg
Water Solubility: soluble	**Solvent Solubility:** soluble in alcohol, acetone, hydrocarbons, and organic solvents

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Non-flammable

Autoignition Temperature: Not Applicable

Flammability Limits in Air (Volume %): **UPPER:** Not Applicable
LOWER: Not Applicable

Unusual Fire and Explosion Hazards: Cylinders may rupture under fire conditions. Nitrogen reacts with lithium, magnesium, neodymium at high temperatures. Mixtures of ozone and nitrogen may be explosive. Titanium is the only element that will burn in nitrogen.

Extinguishing Media: Use extinguishing media that is appropriate to the surrounding fire.

Special Fire Procedures: Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) when this material is involved in a fire. Keep fire cylinders cool with water spray. If possible, stop the product flow.

SECTION V. REACTIVITY DATA

Stability: **X** **Stable** _____ **Unstable**

Conditions to Avoid: Protect cylinders from physical damage and sources of heat. **DO NOT** store the cylinder in poorly ventilated areas.

Incompatibility (Materials to Avoid): Nitrogen is incompatible with metals and oxidizing materials.

See Section IV: " Fire and Explosion Hazard Data".

Hazardous Decomposition or Byproducts: Thermal decomposition of nitrogen will produce oxides of nitrogen.

Hazardous Polymerization _____ **Will Occur** **X** **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **X** **Inhalation** **X** **Skin** _____ **Ingestion**

Nitrogen: This material is a high pressure gas that can cause rapid suffocation. This gas may also cause eye, skin, and respiratory tract burns. The mixture can act as a simple asphyxiant by displacing air necessary for life. Nitrogen inhaled under increased atmospheric pressure, (>1.5 atmospheres), may dissolve in the fat-containing brain cells, and act as an anesthetic, causing necrosis. Persons who have been exposed to nitrogen under increased pressure and then suddenly released from the pressure may develop decompression sickness. Decompression is sickness caused by the formation of nitrogen bubbles in the blood following a rapid drop in pressure and is characterized by severe pains in the joints and chest, skin irritation, cramps, and paralysis.

Medical Conditions Generally Aggravated by Exposure: Nitrogen aggravates respiratory disorders.

Listed as a Carcinogen/Potential Carcinogen (Nitrogen):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

Listed as a Carcinogen/Potential Carcinogen (Non-Methane Hydrocarbon Compounds):*

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	*	
In the International Agency for Research on Cancer (IARC) Monographs	*	
By the Occupational Safety and Health Administration (OSHA)	*	

***NOTE:** Many non-methane hydrocarbon compounds are classified as carcinogens or potential carcinogens.

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with copious amounts of water for at least 15 minutes while removing contaminated clothing. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance if necessary.

Inhalation: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Lay victim with head and chest lower than hips to improve drainage of fluids from the lungs. Obtain medical assistance.

Ingestion: Not applicable (gas)

TARGET ORGAN(S) OF ATTACK: Not available

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released: Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat. In case of leakage, use SCBA.

Waste Disposal: Dispose of gas into an adequate amount of alkaline potassium permanganate solution. Dispose of non-refillable cylinders in accordance with federal, state, and local regulations. **DO NOT** return the empty cylinder to the supplier.

Handling and Storage: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Wear safety shoes when handling cylinders. Use adequate general and local exhaust ventilation to maintain concentrations below exposure limits and to avoid asphyxiation. A chemical safety shower and an eyewash station must be readily available. For protection of eyes, wear safety glasses.

> **NOTE:** Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store in well ventilated areas away from combustibles. Keep valve protection cap on cylinders when not in use.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Source(s): MDL Information Systems, Inc., MSDS *Nitrogen*, 19 March 2003.